

**CLAIM AMENDMENT(S)**

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4       **1.**     (original) One or more electronically-accessible media comprising  
5 electronically-executable instructions that comprise at least part of an operating  
6 system, the at least part of the operating system including:

7             an application programming interface that is capable of creating callback-  
8 type dynamic function tables, each callback-type dynamic function table including  
9 a begin address, an end address, and a callback function; wherein the operating  
10 system calls the callback function when an exception occurs within an address  
11 range bounded by the begin address and the end address, the callback function  
12 requesting exception handling and/or unwind information from a runtime  
13 component.

14  
15       **2.**     (original) The one or more electronically-accessible media as recited  
16 in claim 1, wherein the callback function returns from the runtime component data  
17 for code address-to-pointer information.

18  
19       **3.**     (original) The one or more electronically-accessible media as recited  
20 in claim 2, wherein the data for code address-to-pointer information comprises a  
21 reference to the code address-to-pointer information.

1           4.     (original) The one or more electronically-accessible media as recited  
2 in claim 2, wherein the data for code address-to-pointer information comprises the  
3 code address-to-pointer information.  
4

5           5.     (original) The one or more electronically-accessible media as recited  
6 in claim 4, wherein the code address-to-pointer information comprises a start  
7 address, a final address, and an unwind pointer.  
8

9           6.     (original) One or more electronically-accessible media comprising  
10 electronically-executable instructions that utilize an application programming  
11 interface, the application programming interface facilitating creation of callback-  
12 type dynamic function tables; each callback-type dynamic function table including  
13 a begin address, an end address, and a callback function, each callback-type  
14 dynamic function table corresponding to a code heap that stores code for a  
15 plurality of functions in a runtime environment; wherein interaction between the  
16 runtime environment and an operating system is precipitated upon calling the  
17 callback function to acquire exception handling and/or unwind information.  
18

19           7.     (original) The one or more electronically-accessible media as recited  
20 in claim 6, wherein the interaction between the runtime environment and the  
21 operating system comprises (i) the operating system requesting exception handling  
22 and/or unwind information from the runtime environment and (ii) the runtime  
23 environment providing the exception handling and/or unwind information to the  
24 operating system.  
25

1           **8.**     (original) The one or more electronically-accessible media as recited  
2 in claim 6, wherein the begin address and the end address of each callback-type  
3 dynamic function table comprises a begin address and an end address of a  
4 respective code heap to which a respective callback-type dynamic function table  
5 corresponds.

6  
7           **9.**     (original) The one or more electronically-accessible media as recited  
8 in claim 6, wherein the exception handling and/or unwind information comprises  
9 data for code address-to-pointer information for a particular function of the  
10 plurality of functions.

11  
12           **10.**   (original) The one or more electronically-accessible media as recited  
13 in claim 9, wherein the particular function of the plurality of functions is  
14 ascertained using an instruction pointer that is passed as an argument of the  
15 callback function.

16  
17           **11.**   (original) The one or more electronically-accessible media as recited  
18 in claim 6, wherein each callback-type dynamic function table is created, at least in  
19 part, by adding each callback-type dynamic function table to a linked list of  
20 dynamic function tables.

21  
22           **12.**   (original) The one or more electronically-accessible media as recited  
23 in claim 11, wherein the linked list of dynamic function tables includes one or  
24 more non-callback-type dynamic function tables.  
25

1           **13.**   (original) One or more electronically-accessible media comprising  
2 electronically-executable instructions that comprise at least part of a runtime  
3 component, the runtime component adapted to manage exception handling and/or  
4 unwind information for a plurality of functions that are executing as part of a  
5 runtime environment, the runtime component capable of providing data for code  
6 address-to-pointer information to an operating system when an exception occurs  
7 with respect to a particular function of the plurality of functions.

8  
9           **14.**   (original) The one or more electronically-accessible media as recited  
10 in claim 13, wherein the data for code address-to-pointer information comprises a  
11 reference to the code address-to-pointer information for the particular function of  
12 the plurality of functions.

13  
14           **15.**   (original) The one or more electronically-accessible media as recited  
15 in claim 13, wherein the data for code address-to-pointer information comprises  
16 the code address-to-pointer information for the particular function of the plurality  
17 of functions.

18  
19           **16.**   (original) The one or more electronically-accessible media as recited  
20 in claim 15, wherein the code address-to-pointer information comprises a start  
21 address, a final address, and an unwind pointer for the particular function of the  
22 plurality of functions.

1           **17.**   (original) An electronic device comprising:  
2           a runtime environment that is managing code for a plurality of functions;  
3           and  
4           an operating system that is managing a linked list of dynamic function  
5           tables that are searched when an exception occurs, the operating system adapted to  
6           call a callback function as indicated by a dynamic function table of the linked list  
7           of dynamic function tables to request that the runtime environment provide  
8           exception handling and/or unwind information for at least one function of the  
9           plurality of functions;  
10          wherein the runtime environment is capable of providing to the operating  
11          system the exception handling and/or unwind information for the at least one  
12          function of the plurality of functions responsive to the callback function.

13  
14          **18.**   (original) The electronic device as recited in claim 17, wherein the  
15          dynamic function table comprises a callback dynamic function table.

16  
17          **19.**   (original) The electronic device as recited in claim 18, wherein the  
18          linked list of dynamic function tables comprises at least one sorted dynamic  
19          function table and at least one unsorted dynamic function table.

20  
21          **20.**   (original) The electronic device as recited in claim 17, wherein the  
22          dynamic function table corresponds to more than one function of the plurality of  
23          functions.

1           **21.**   (original) The electronic device as recited in claim 17, wherein the  
2 dynamic function table includes a begin address entry and an end address entry that  
3 reflect a begin address and an end address, respectively, of a code heap that  
4 includes more than one function of the plurality of functions, including the at least  
5 one function of the plurality of functions.

6  
7           **22.**   (original) The electronic device as recited in claim 17, wherein the  
8 runtime environment comprises at least one just-in-time (JIT) compiler.

9  
10          **23.**   (original) The electronic device as recited in claim 17, wherein the  
11 exception handling and/or unwind information comprises data for code address-to-  
12 pointer information for the at least one function of the plurality of functions.

13  
14          **24.**   (original) The electronic device as recited in claim 23, wherein the  
15 data for code address-to-pointer information for the at least one function of the  
16 plurality of functions directly or indirectly provides to the operating system a start  
17 address, a final address, and an unwind pointer for the at least one function of the  
18 plurality of functions.

1           **25.**   (original) One or more electronically-accessible media comprising a  
2 data structure, the data structure comprising:

3           a begin address;

4           an end address; and

5           a callback function that, when called, returns from a runtime environment  
6 exception handling and/or unwind information for a function associated with at  
7 least one address that is between the begin address and the end address.

8  
9           **26.**   (original) The one or more electronically-accessible media as recited  
10 in claim 25, wherein the begin address and the end address reflect a begin address  
11 and an end address, respectively, for a code heap of the runtime environment.

12  
13           **27.**   (original) The one or more electronically-accessible media as recited  
14 in claim 26, wherein the code heap includes code for a plurality of functions.

15  
16           **28.**   (original) The one or more electronically-accessible media as recited  
17 in claim 27, wherein the callback function, when called, is capable of returning  
18 from the runtime environment exception handling and/or unwind information for  
19 any function of the plurality of functions.

20  
21           **29.**   (original) The one or more electronically-accessible media as recited  
22 in claim 25, wherein the callback function is called by an operating system to  
23 enable the operating system to unwind a stack.

1           **30.**   (original) The one or more electronically-accessible media as recited  
2 in claim 25, wherein the callback function accepts as input the at least one address  
3 that is associated with the function, the at least one address comprising an  
4 instruction pointer.

5  
6           **31.**   (original) The one or more electronically-accessible media as recited  
7 in claim 25, wherein the callback function accepts as input a reference to at least  
8 part of the data structure.

9  
10          **32.**   (original) The one or more electronically-accessible media as recited  
11 in claim 25, wherein the exception handling and/or unwind information comprises  
12 data for code address-to-pointer information for the function that is associated with  
13 the at least one address.

14  
15          **33.**   (original) The one or more electronically-accessible media as recited  
16 in claim 25, wherein the begin address, the end address, and the callback function  
17 together comprise a callback dynamic function table.

18  
19          **34.**   (original) The one or more electronically-accessible media as recited  
20 in claim 33, wherein the data structure further comprises:

21           a plurality of dynamic function tables, the plurality of dynamic function  
22 tables including the callback dynamic function table.  
23  
24  
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1           **35.**   (original) An electronic device comprising:  
2           at least one processor; and  
3           one or more media in operative communication with the at least one  
4 processor, the one or more media including a data structure comprising:  
5                 a begin address value;  
6                 an end address value; and  
7                 a callback function that, when called, returns from a runtime  
8 environment exception handling and/or unwind information for a function  
9 associated with at least one address that is between the begin address value  
10 and the end address value.

11  
12           **36.**   (original) The electronic device as recited in claim 35, wherein the  
13 one or more media further include a code heap managed by the runtime  
14 environment, the code heap having a begin address and an end address; the begin  
15 address value and the end address value reflecting the begin address and the end  
16 address, respectively, of the code heap.

17  
18           **37.**   (original) The electronic device as recited in claim 36, wherein the  
19 code heap includes code for a plurality of functions.

20  
21           **38.**   (original) The electronic device as recited in claim 37, wherein the  
22 callback function, when called, is capable of returning from the runtime  
23 environment exception handling and/or unwind information for any function of the  
24 plurality of functions responsive to the at least one address.  
25

1           **39.**   (original) The electronic device as recited in claim 35, wherein the  
2 one or more media further include a stack; and wherein the callback function is  
3 called by an operating system to enable the operating system to unwind the stack.  
4

5           **40.**   (original) One or more electronically-accessible media comprising  
6 electronically-executable instructions that include:

7           a callback function, the callback function accepting as input an instruction  
8 pointer that is associated with an address of a function from a runtime environment  
9 and producing as output data for code address-to-pointer information for the  
10 function having the address that is associated with the instruction pointer;

11           wherein the callback function may be called by an operating system and  
12 implemented by the runtime environment.  
13

14           **41.**   (original) The one or more electronically-accessible media as recited  
15 in claim 40, wherein the callback function further accepts as input a reference to a  
16 callback dynamic function table for context.  
17

18           **42.**   (original) The one or more electronically-accessible media as recited  
19 in claim 41, wherein the callback dynamic function table includes a begin address  
20 and an end address that define an address range that includes the instruction  
21 pointer.  
22  
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24  
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1           **43.**   (original) The one or more electronically-accessible media as recited  
2 in claim 40, wherein the data for code address-to-pointer information that is output  
3 by the callback function is provided from the runtime environment to the operating  
4 system.

5  
6           **44.**   (original) The one or more electronically-accessible media as recited  
7 in claim 40, wherein the data for code address-to-pointer information comprises a  
8 reference to the code address-to-pointer information.

9  
10          **45.**   (original) The one or more electronically-accessible media as recited  
11 in claim 44, wherein the referenced code address-to-pointer information comprises  
12 a start address, a final address, and an unwind pointer for the function having the  
13 address that is associated with the instruction pointer.

14  
15          **46.**   (original) The one or more electronically-accessible media as recited  
16 in claim 40, wherein the data for code address-to-pointer information comprises  
17 the code address-to-pointer information.

18  
19          **47.**   (original) The one or more electronically-accessible media as recited  
20 in claim 40, wherein the callback function is adapted to be called by the operating  
21 system during an exception handling procedure.  
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1           **48.**   (original) The one or more electronically-accessible media as recited  
2 in claim 40, wherein the callback function is implemented, at least partially, by the  
3 runtime environment by inspecting a code header for the function having the  
4 address that is associated with the instruction pointer.

5  
6           **49.**   (original) The one or more electronically-accessible media as recited  
7 in claim 48, wherein the data for code address-to-pointer information is derived  
8 using the code header.

9  
10          **50.**   (original) The one or more electronically-accessible media as recited  
11 in claim 48, wherein the code header is ascertained using a heap structure contents  
12 of a code heap that includes code for the function having the address that is  
13 associated with the instruction pointer.

14  
15          **51.**   (original) One or more electronically-accessible media comprising at  
16 least part of an operating system that is configured to request from a runtime  
17 environment exception handling and/or unwinding information for functions that  
18 are managed by the runtime environment.

19  
20          **52.**   (original) The one or more electronically-accessible media as recited  
21 in claim 51, wherein the at least part of the operating system is further configured  
22 to request from the runtime environment the exception handling and/or unwinding  
23 information after an exception is discovered.

1           **53.**   (original) The one or more electronically-accessible media as recited  
2 in claim 51, wherein the at least part of the operating system is further configured  
3 to request the exception handling and/or unwinding information from the runtime  
4 environment responsive to locating a dynamic function table having a callback  
5 function.

6  
7           **54.**   (original) The one or more electronically-accessible media as recited  
8 in claim 53, wherein the dynamic function table having the callback function  
9 corresponds to at least two functions compiled in the runtime environment by a  
10 just-in-time (JIT) compiler.

11  
12  
13           **55. - 61.**   (canceled)

1           **62.** (original) One or more electronically-accessible media comprising  
2 electronically-executable instructions that, when executed, direct an electronic  
3 device to perform actions comprising:

4           receiving at a runtime an instruction pointer with a request for data for code  
5 address-to-pointer information;

6           ascertaining a runtime function associated with the instruction pointer;

7           accessing a code header of the ascertained runtime function to extract data  
8 for code address-to-pointer information for the ascertained runtime function; and

9           providing the extracted data for code address-to-pointer information from  
10 the runtime.

11  
12           **63.** (original) The one or more electronically-accessible media  
13 comprising the electronically-executable instructions that, when executed, direct  
14 an electronic device to perform the actions as recited in claim 62, wherein the  
15 action of providing comprises the action of:

16           providing from the runtime a pointer to the code address-to-pointer  
17 information for the ascertained runtime function.

18  
19           **64.** (original) The one or more electronically-accessible media  
20 comprising the electronically-executable instructions that, when executed, direct  
21 an electronic device to perform the actions as recited in claim 62, wherein the  
22 action of providing comprises the action of:

23           providing from the runtime to an operating system the extracted data  
24 for code address-to-pointer information.  
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1       **65.**   (original) An electronic device comprising:  
2       at least one processor; and  
3       one or more media including processor-executable instructions that are  
4       capable of being executed by the at least one processor, the processor-executable  
5       instructions adapted to cause the electronic device to perform actions comprising:  
6               locating a callback dynamic function table having a callback  
7       function;  
8               initiating, by an operating system, the callback function to interact  
9       with a runtime;  
10              receiving data for code address-to-pointer information from the  
11       runtime responsive to the initiating; and  
12              using the received data for code address-to-pointer information to  
13       attain information for at least one of exception handling and stack  
14       unwinding.

15  
16       **66.**   (original) The electronic device as recited in claim 65, wherein:  
17       the receiving action comprises:

18              receiving a reference to code address-to-pointer information  
19              from the runtime; and

20       the using action comprises:

21              using the reference to attain code address-to-pointer  
22              information, including an unwind pointer; and  
23              using the unwind pointer to attain unwind information.  
24  
25

1           **67.**   (original) The electronic device as recited in claim 65, wherein the  
2 processor-executable instructions are adapted to cause the electronic device to  
3 perform a further action comprising:

4                   discovering an exception from a runtime function.  
5

6           **68.**   (original) The electronic device as recited in claim 65, wherein the  
7 processor-executable instructions are adapted to cause the electronic device to  
8 perform a further action comprising:

9                   searching a dynamic function table linked list using an instruction  
10 pointer;

11                  wherein the locating action comprises:

12                         locating the callback dynamic function table having the  
13 callback function from the dynamic function table linked list using  
14 the instruction pointer, the callback dynamic function table including  
15 a begin address that is less than and an end address that is greater  
16 than the instruction pointer.  
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1       **69.** (original) The electronic device as recited in claim 68, wherein the  
2 processor-executable instructions are adapted to cause the electronic device to  
3 perform further actions comprising:

4               receiving at the runtime, responsive to the initiating, the instruction  
5 pointer with a request for the data for code address-to-pointer information;

6               ascertaining a runtime function associated with the instruction  
7 pointer;

8               accessing a code header of the ascertained runtime function to  
9 extract the data for code address-to-pointer information for the ascertained  
10 runtime function; and

11              providing, from the runtime to the operating system, the data for  
12 code address-to-pointer information.

13  
14       **70.** (original) One or more electronically-accessible media comprising  
15 electronically-executable instructions that, when executed, direct an electronic  
16 device to perform actions comprising:

17              locating a callback dynamic function table having a callback function;

18              initiating, by an operating system, the callback function to interact with a  
19 runtime;

20              receiving, at the operating system, data for code address-to-pointer  
21 information from the runtime responsive to the initiating; and

22              using the received data for code address-to-pointer information to attain  
23 information for at least one of exception handling and stack unwinding.

1           71.   (canceled)

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4           72.   (original) An arrangement comprising:

5           means for locating a dynamic function table having a callback function;

6           means for initiating the callback function to interact with a runtime  
7 environment;

8           means for receiving data for code address-to-pointer information from the  
9 runtime environment responsive to the callback function initiation; and

10          means for using the received data for code address-to-pointer information to  
11 attain information for at least one of exception handling and stack unwinding.  
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**ELECTION OF GROUP**

From among the identified Groups as stipulated by the Office Action,

Applicants hereby elect Group I, corresponding  
to at least claims 1-54, 62-70, and 72,

for prosecution in the instant Application.